

REMARKS

In the final Office Action mailed on January 3, 2006 (paper no. 122), the Examiner rejected claims 13-17 under 35 U.S.C. § 112, second paragraph; and rejected claims 1-25 under 35 U.S.C. § 102(b) over U.S. Patent No. 5,832,299 to Wooten ("Wooten"). To more clearly identify the subject matter for which protection is being sought, applicant herein amends claims 1, 5-7, 9, 13-20, and 25; and presents new claims 26-56. Accordingly, claims 1-56 are now pending. For the reasons discussed in detail below, applicant submits that the pending claims are all in condition for allowance.

The Examiner rejected claims 13-17 under 35 U.S.C. § 112, second paragraph, identifying antecedent basis issues with these claims. Applicant herein amends these claims to resolve the identified antecedent basis issues.

The Examiner rejected claims 1-25 under 35 U.S.C. § 102(b) over Wooten. Applicant respectfully traverses this rejection.

All of the pending claims are directed to specific manners of executing code when a processor enters a system management mode ("SMM"). As was made clear in the October 20, 2005 response, applicant fervently disagrees with the Examiner's position that the virtual system mode ("VSM") discussed by Wooten is the same as the system management mode whose entry is recited by applicant's claims. Indeed, as is discussed in greater detail in the October 20, 2005 response, Wooten both (1) decries the substantial disadvantages that he perceives in system management mode (1:60-3:8), and (2) identifies the virtual system mode as a new mode relative to existing modes such as system management mode (3:11-13). Further, as is discussed in greater detail below, processor behavior in virtual system mode as described by Wooten is inconsistent with the processor behavior recited by applicant's claims.

Though applicant persists in his position that the virtual system mode discussed by Wooten fails to qualify as the system management mode whose entry is recited as part of the original claims, applicant herein describes additional distinctions between the pending claims and Wooten.

Original claims 1 and 5 each recited using a global descriptor table that is different from the global descriptor table in use when the system management mode interrupt occurred. In rejecting claims 1 and 5 based upon their original language, the Examiner indicated that (1) in Wooten, the contents of the global descriptor table might change after the processor enters virtual system mode, and (2) a global descriptor table whose contents changed after the processor enters virtual system mode satisfies the original claim language that calls for a different global descriptor table. While applicant disagrees that such possibly changing contents of the global descriptor table are fairly described by the original claim language regarding using a different global descriptor table, Applicant herein amends claims 1 and 5 to recite replacing contents of a global descriptor table register such that, rather than continuing to point to a first global descriptor table that was in use when a system management mode interrupt occurred, instead points to a second global descriptor table that is distinct from that first global descriptor table. Applicant submits that Wooten does not disclose changing the contents of the global descriptor table register to point to a different global descriptor table as recited in these pending claims. Additionally, as far as applicant can determine, no useful purpose would be served by such replacement in Wooten. Accordingly, claims 1 and 5 are patentable over Wooten, as are their dependent claims 2-4, 6-17, and 28-45.

Claim 18 recites a system management mode interrupt routine that, among other acts, switches the processor to protected mode. Applicant notes that a system management mode interrupt routine is executed in response to a system management mode interrupt. Wooten simply does not disclose switching the processor to protected mode as part of entering virtual system mode. As a first matter, Wooten indicates at 7:20-23 that, "virtual system mode selection is controlled by a bit in the VSM Enable Register

238, discussed below, and is independent of the user mode and therefore does not affect the use of the PG, PE or VM bits," discussed elsewhere in Wooten as defining the user modes of operation of the processor, i.e., real, protected, or virtual 8086 mode. If this means of entering virtual system mode is independent of user mode, then entering virtual system mode has no effect on the user mode that is selected, and does not involve switching the processor to protected mode. At various other points such as 3:20-23, 3:35-38, 10:34-37, and 10:43-45, Wooten makes clear that, rather than causing the processor to enter into any new user mode, entry into virtual system mode quite intentionally retains the user mode that was in use prior to entering VSM. That is, if the processor is in real mode when VSM is entered, it retains real mode; if the processor is in protected mode when VSM is entered, protected mode is retained; and if the processor is in virtual 8086 mode when VSM is entered, virtual 8086 mode is retained. Under no conditions does entry into VSM cause the processor to switch to protected mode from any other user mode upon entering VSM. To the extent that Wooten can be said to describe entering a different mode upon entering virtual system mode, this mode is virtual system mode itself, not a different user mode such as protected mode. Accordingly, claim 18 is patentable over Wooten, as are its dependent claims 19-25 and 46-56.

Several of the new claims are directed to the particular means by which the recited system management mode is entered, including: receiving a signal on a processor package pin (claims 26, 36, and 47), such as the SMI# package pin (claims 27, 37, and 48); receiving a message via an APIC bus of the processor (claims 28, 38, and 49); receiving a message via a front side bus of the processor (claims 29, 39, and 50); in response to a processor chip set (claims 30, 40, and 51), such as a Northbridge controller (claims 31, 41, and 53) or Southbridge controller (claims 32, 42, and 54); and in response to an electronic circuit (claims 32, 42, and 54). Applicant submits that Wooten does not describe entering his virtual system mode in any of these recited matters. To the contrary, he indicates that "transitions from the user modes to virtual system mode can be made by indirect calls through a call gate, such as by a jump or call instruction, or through vectored entries, such as a hardware interrupt or I/O fault." (3:24-27) Because Wooten does not

entering the recited system management mode in any of the manners recited by these claims, claims 26-33, 36-43, and 47-54 are further patentable over Wooten.

Several of the new claims recite details of exiting the recited system management mode that are not disclosed by Wooten as being performed as part of exiting virtual system mode, and are in fact incompatible with a virtual system mode. Claims 34, 44, and 55 recite returning from system management mode by executing an RSM instruction. At 3:24-27, Wooten indicates that virtual system mode may be exited using any of only three instructions, indicated at 18:28-32 to be IRET, RECC, and RENCC. Accordingly, Wooten does not describe exiting virtual system mode by executing an RSM instruction as recited in these claims, and claims 34, 44, and 55 are therefore further patentable over Wooten. Claims 35, 45, and 56 recite changing the contents of a hardware register indicating a cause that triggered an SMM interrupt as part of exiting a recited system management mode. Wooten does not disclose clearing a register indicating a reason that virtual system mode was entered. Indeed, as far as applicant can tell from reading Wooten, no register having such contents exists to be cleared on exit from virtual system mode. Accordingly, claims 35, 45, and 56 are further patentable over Wooten.

For the reasons discussed above, applicant submits that all the pending claims are in condition for allowance, and therefore earnestly solicits a prompt Notice of Allowance.

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Respectfully submitted,

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